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(71) Applicant: **Matsushita Electric Industrial Co., Ltd.**
Kadoma-shi, Osaka-fu, 571-8501 (JP)

(72) Inventors:
• **Gyoten, Hisaaki**
Shijonawate-shi, Osaka 575-0013 (JP)
• **Hatoh, Kazuhito**
Daitou-shi, Osaka, 574-0076 (JP)
• **Nishida, Kazufumi,**
Moriguchi-shi, Osaka 570-0016 (JP)

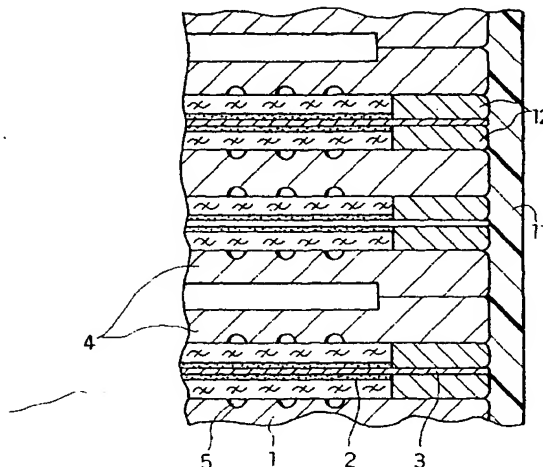
- **Ohara, Hideo**
Kadoma-shi, Osaka 571-0014 (JP)
- **Yasumoto, Eiichi**
Katano-shi, Osaka 576-0021 (JP)
- **Kanbara, Teruhisa**
Ikeda-shi, Osaka 563-0021 (JP)
- **Uchida, Makoto**
Hirakata-shi, Osaka 573-1145 (JP)
- **Sugawara, Yasushi**
Neyagawa-shi Osaka 572-0055 (JP)
- **Matsumoto, Toshihiro**
Ibaraki-shi, Osaka 567-0821 (JP)
- **Nakagawa, Kouji**
Ninamikawachi-gun, Osaka 583-0992 (JP)

(74) Representative: **Dr. Elisabeth Jung**
Dr. Jürgen Schirdewahn Dipl.-Ing. Claus
Gernhardt
Clemensstrasse 30
80803 München (DE)

(54) **Solid polymer electrolyte fuel cell and method for producing the same**

(57) A compact solid polymer electrolyte fuel cell having a simplified structure of a high mechanical strength and an improved gas-sealing property is disclosed. In the solid polymer electrolyte fuel cell of the present invention, gas-tight electrically insulating layers (11,12) are provided on the flanks or the insides of the module of the above-mentioned laminated unit cells, thereby to give a gas-tightness between said electrode and separator (4).

FIG. 8



EP 0 951 086 A3



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Application Number

EP 99 10 6282

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 10, 31 October 1996 (1996-10-31) -& JP 08 162143 A (TOYOTA MOTOR CORP), 21 June 1996 (1996-06-21) * abstract *	1-3, 5, 8	H01M8/02 H01M8/24
Y	---	6, 11, 12	
Y	PATENT ABSTRACTS OF JAPAN vol. 012, no. 337 (E-657), 12 September 1988 (1988-09-12) -& JP 63 098970 A (FUJI ELECTRIC CO LTD), 30 April 1988 (1988-04-30) * abstract *	6	
Y	---	6	
Y	PATENT ABSTRACTS OF JAPAN vol. 013, no. 564 (E-860), 14 December 1989 (1989-12-14) -& JP 01 235165 A (FUJI ELECTRIC CO LTD), 20 September 1989 (1989-09-20) * abstract *	6	
Y	---	11	TECHNICAL FIELDS SEARCHED (Int.Cl.6) H01M
Y	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 12, 26 December 1996 (1996-12-26) -& JP 08 222237 A (AISIN AW CO LTD; AQUEOUS RES:KK), 30 August 1996 (1996-08-30) * abstract *	11	
Y	---	12	
	US 5 300 370 A (WASHINGTON KIRK B ET AL) 5 April 1994 (1994-04-05) * column 10, line 41 - line 54: claim 1; figure 10 * * column 13, line 55 - line 68 * --- -/--	12	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24 August 2001	Examiner D'hondt, J
CATEGORY OF CITED DOCUMENTS		1 : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date O : document cited in the application I : document cited for other reasons X : member of the same patent family, corresponding document	
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Application Number
EP 99 10 6282

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)	
P,X	GB 2 323 700 A (BALLARD POWER SYSTEMS) 30 September 1998 (1998-09-30) * page 17, line 6 - line 12; figure 5B * * page 13, last paragraph * * page 2, line 3 - line 6 * * page 15, line 5 - line 9; figure 3D * * page 10, line 6 - line 12 * * claims 1,8,9,18-20 * * page 10, line 13 - page 11, line 2 * ---	1,2,4,5, 8-10, 12-14		
P,X	WO 98 33225 A (MAGNET MOTOR GMBH ;KOSCHANY ARTHUR (DE); SCHWESINGER THOMAS (DE)) 30 July 1998 (1998-07-30) * page 15, line 4 - page 18, line 2; claims 1,2,11-18,27,32,33 * * page 18, line 22 - page 9, line 2 * ---	1,2,5,8		
P,X	GB 2 326 017 A (MOTOROLA INC) 9 December 1998 (1998-12-09) * page 2, line 21 - page 3, line 2; figure 2 * ---	1,2,4,5, 14		TECHNICAL FIELDS SEARCHED (Int.Cl.6)
X	PATENT ABSTRACTS OF JAPAN vol. 013, no. 240 (E-767), 6 June 1989 (1989-06-06) -& JP 01 043974 A (HITACHI LTD), 16 February 1989 (1989-02-16) * abstract * ---	1-5,14		
A	PATENT ABSTRACTS OF JAPAN vol. 013, no. 468 (E-834), 23 October 1989 (1989-10-23) -& JP 01 183071 A (MEIDENSHA CORP), 20 July 1989 (1989-07-20) * abstract * ---	1		
-/--				
The present search report has been drawn up for all claims				
Place of search:		Date of completion of the search	Examiner	
THE HAGUE		24 August 2001	D'hondt, J	
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>I : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date O : document cited in the application I : document cited for other reasons X : member of the same patent family corresponding document</p>				



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Application Number
EP 99 10 6282

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.6)
A	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 07, 31 July 1996 (1996-07-31) -& JP 08 078028 A (AQUEOUS RES:KK), 22 March 1996 (1996-03-22) * abstract *	1	
A	PATENT ABSTRACTS OF JAPAN vol. 007, no. 036 (E-158), 15 February 1983 (1983-02-15) -& JP 57 187874 A (HITACHI SEISAKUSHO KK), 18 November 1982 (1982-11-18) * abstract *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.CI.6)
Place of search		Date of completion of the search	Examiner
THE HAGUE		24 August 2001	D'hondt, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background G: non-written disclosure I: intermediate document</p> <p>T: theory or principle underlying the invention E: earlier patent document, but published on or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document</p>			

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EP 99 10 6282

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24-08-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 08162143 A	21-06-1996	NONE	
JP 63098970 A	30-04-1988	NONE	
JP 01235165 A	20-09-1989	NONE	
JP 08222237 A	30-08-1996	NONE	
US 5300370 A	05-04-1994	AU 5415994 A WO 9411912 A	08-06-1994 26-05-1994
GB 2323700 A	30-09-1998	DE 19713250 A US 6080503 A CA 2233440 A GB 2348047 A, B	15-10-1998 27-06-2000 29-09-1998 20-09-2000
WO 9833225 A	30-07-1998	DE 19703214 C AU 6617298 A CN 1251212 T EP 0966770 A	05-11-1998 18-08-1998 19-04-2000 29-12-1999
GB 2326017 A	09-12-1998	DE 19823880 A FR 2764122 A SE 9801942 A	10-12-1998 04-12-1998 04-12-1998
JP 01043974 A	16-02-1989	NONE	
JP 01183071 A	20-07-1989	JP 2748379 B	06-05-1998
JP 08078028 A	22-03-1996	NONE	
JP 57187874 A	18-11-1982	JP 1439833 C JP 62046952 B	19-05-1988 05-10-1987

EP 0 951 086 A3

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82